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**Stem cell-based rapid identification of SARS-CoV-2 T cell epitopes and T cell receptors for therapeutic use**

**Grant Award Details**

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Stem cell-based rapid identification of SARS-CoV-2 T cell epitopes and T cell receptors for therapeutic use

**Grant Type:** Discovery Research Projects

**Grant Number:** DISC2COVID19-11817

**Project Objective:** The objective of the project is to develop a platform tool technology to identify both SARS-CoV-2 T cell epitopes for vaccine development and specific TCRs for adoptive T cell therapy.

**Investigator:**

<b>Name:</b>	Gay Crooks
<b>Institution:</b>	University of California, Los Angeles
<b>Type:</b>	PI

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**Disease Focus:** COVID-19, Infectious Disease, Respiratory Disorders

**Human Stem Cell Use:** Adult Stem Cell

**Award Value:** \$126,692

**Status:** Active

**Grant Application Details**

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**Application Title:** Stem cell-based rapid identification of SARS-CoV-2 T cell epitopes and T cell receptors for therapeutic use

**Public Abstract:****Research Objective**

We will identify SAR-CoV-2 T cell epitopes for vaccine development and specific TCRs for adoptive T cell therapy using a stem cell-based platform to generate specialized dendritic cells in vitro.

**Impact**

New methods to rapidly identify T cell epitopes would greatly accelerate development of vaccines and TCR-based therapeutics, and in the setting of COVID-19 is an area of urgent unmet medical need.

**Major Proposed Activities**

- Adaptation of hematopoietic stem cell-based cDC1 platform to SARS-CoV-2
- Capture and TCR sequencing of SARS-CoV-2 reactive T cells
- Cloning of SARS-CoV-2 reactive TCRs and construction of a TCR reporter cell line library
- Epitope mapping by peptide-MHC functional screen
- Tetramer construction and convalescent validation cohort
- Data dissemination and translational planning

**Statement of Benefit to California:**

The threat of the COVID-19 pandemic to the health of California citizens and the economy of the state is incalculable. While new treatments for established disease are vital, prevention of the viral infections is the only realistic solution to ongoing suffering and societal dislocation. Our proposed research builds on our ability to generate specialized immune cells in the lab from blood forming stem cells and to use them to discover the viral antigens that have highest potency for vaccines.

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**Source URL:** <https://www.cirm.ca.gov/our-progress/awards/stem-cell-based-rapid-identification-sars-cov-2-t-cell-epitopes-and-t-cell>